

Application No.: 10/716,181
Amendment Dated January 17, 2008
Reply to Office Action of September 17, 2007
Docket No.: F132

Remarks/Arguments

Claims 1-46 are in the application after amendment. Claims 40-41 have been previously withdrawn. Claims 42-46 are added by this Amendment. Claims 1, 9, 15, 24, 39, and new claim 42 are in independent form.

Claims Rejection Under 35 U.S.C. § 112

Claims 1-39 are rejected under 35 U.S.C. § 112 as indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Specifically, most of the rejected claims are rejected for using the word "closely," while the rest were rejected for using the word "slightly." According to the Examiner, each of these words is "a relative term that lacks basis for comparison." Applicants disagree.

The second paragraph of 35 U.S.C. § 112 only requires claims to set out and circumscribe a particular area with a reasonable degree of precision and particularity. *In re Johnson*, 558 F.2d 1008, 1015, 194 USPQ 187, 193 (CCPA 1977). "The Examiner's focus during examination of claims for compliance with the requirement for definiteness of 35 U.S.C. § 112, second paragraph, is whether the claims meet the threshold requirements of clarity and precision, not whether more suitable language or modes of expression are available. . . . Some latitude in the manner of expression and the aptness of terms is permitted even though the claim language is not as precise as the examiner might desire." MPEP § 2173.02. Furthermore, the appellants may use functional language, alternative expressions, negative limitations, or any style of expression or format of claim which makes clear the boundaries of the subject matter for which protection is sought. MPEP § 2173.01.

The particular terms used in Applicants' claims are more appropriately described as "terms

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of degree" because they modify the degree to which the mill rate of the second material must approximate the mill rate of the first material—"closely approximate" in one set of claims and "equal to or slightly greater than" in the other. The use of such terms is very common in patent claims¹ and has long been approved by the Federal Circuit Court. For example, in *Andrew Corp. v. Gabriel Electronics Inc.*, 847 F.2d 819, 821-22, 6 USPQ2d 2010, 2013 (Fed.Cir.1988), the Court specifically noted that terms such as "approach each other," "close to," "substantially equal," and "closely approximate" (virtually the same phrase used in Applicants' claims) are seemingly used everywhere in patent claims and that such usages, when serving reasonably to describe the claimed subject matter to those of skill in the field of the invention and to distinguish the claimed subject matter from the prior art, have been accepted in patent examination and upheld by the courts. More recently, this point was reaffirmed by the Federal Circuit in *Ecolab, Inc. v. Envirochem, Inc.*, 264 F.3d 1358, 60 USPQ2d 1173 (Fed. Cir. 2001). The *Ecolab* Court noted that terms of degree are commonly used in patent claims to "avoid a strict numerical boundary to the specified parameter."

Although not published, *Ex Parte Rasmussen*, 1998 WL 1780745 (Bd. Pat. App. & Interf. 1998) is instructive. Because this opinion is non-published, a copy is attached to this Response as an appendix. In *Rasmussen*, the Examiner had rejected claims under 35 USC § 112 as indefinite for using the phrase "shaped to closely overlay." (emphasis added.) The Board did not sustain the Examiner's rejection and noted " We do not understand the reasoning behind the examiner's

1 Applicants note that, since 1976, the term "closely" has been used in the claims of more than 47,000 issued patents, while the exact phrase used in Applicants' Specification, "closely approximates," has been used in the claims of more than 330 issued patents. Likewise, the term "slightly" has been used in the claims of more than 57,000 issued patents, while the exact phrase used in Applicants' Specification, "slightly greater than," has been used in the claims of more than 7700 issued patents.

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problem with the phrase "shaped to closely overlay". . . . From our perspective, the language of the claim, especially when considered in the light of the explanation of the invention provided in the specification, very clearly describes the [element of the invention at issue] and its relationship to the other components of the claimed invention." *Id.* at *2.

In the present case, as in *Rasmussen*, the use of the rejected terms is explained fully in the Specification. For example, Applicants' Specification states:

[1062] Preferably, an appropriate overcoat material will have a mill rate at higher incidence angles that closely approximates the mill rate of the structure material. Most preferably, an appropriate overcoat material will have a mill rate at higher incidence angles that is equal to or slightly higher than the mill rate of the structure material. Skilled persons will realize that an overcoat material with a slightly lower mill rate than the structure at higher incidence angles might provide acceptable results, but there would likely be some degree of curtaining. As discussed above, where possible, it is desirable for the mill rates of overcoat and substrate to match throughout a broader range of higher incidence angles (for example from 45 degrees approaching 90 degrees) in order to account for variations in milling conditions.

The Specification makes it clear that the closer the two mill rates are, the less surface variation that will result. However, no two different materials will have the exact same milling rate. Further, the difference in milling rate will vary at different incidence angles. Specification at [1045]. As a result, the mill rates may be similar at some incidence angles but very different at other incidence angles. According to Applicants' invention, better results will be obtained if the mill rates are matched from around 75 to 90 degrees. *Id.* at [1051]. Further, FIG. 4 of the Application and the accompanying text provide an illustration of the mill rate matching process for a Permalloy substrate and two different possible overcoat materials. *Id.* at [1046] to [1051].

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As was the case in *Rasmussen*, the language of Applicants' claims, especially when considered in the light of the explanation of the invention provided in the Specification, very clearly describes the degree to which the mill rate of the overcoat material must approximate the mill rate of the substrate material. As a result, Applicants request that the § 112 rejections be withdrawn.

Claims Rejection Under 35 U.S.C. § 102

Claims 1 and 4-7 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5,874,010 to Tao et al ("Tao"). A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987); see M.P.E.P. § 2131. Applicant submits that the references cited by the Examiner do not set forth, either expressly or inherently, all of the elements of the rejected claims.

The Tao reference is completely different than Applicants' invention and does not teach any of the significant limitations in Applicants' claims. In Tao, the layer deposited onto the substrate is a mask layer. As such it is intended to protect the substrate during etching. Because the mask material etches much more slowly than the substrate, the "pole-piece material" is etched away where it is not covered by the mask, but is not etched where the mask is present. This process, which is well-known in lithography, has virtually nothing in common with Applicants' invention.

In fact, Tao teaches a process which is essentially the exact opposite of Applicants' invention. Contrary to the limitations in Applicants' claims, the mill rate of the mask layer in Tao must be significantly different (slower) than the mill rate of the substrate or the mask effect will not work and the desired pole structure will not be formed. In contrast to Tao, Applicants' invention

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teaches matching the milling rates of the overcoat and the substrate. For example, claim 1 requires that the deposited layer have "mill rates at higher incidence angles that closely approximate the mill rates of the first material [the substrate] at those incidence angles." According to Applicants invention, the overcoat layer does not protect the substrate from milling, rather the focused ion beam is used to slice through both layers and produce a vertical cross-section face.

Applicants also note that the process taught by Tao would not produce a uniformly planar face on the cross-section as also required by Applicants' claims. As explained in great detail in Applicants' Specification, an overcoat material with a substantially lower mill rate (such as the mask layer taught by Tao) would produce a great deal of curtaining. Further, Tao does not mention or suggest any consideration of mill rates at higher incidence angles in the selection of the mask layer.

Accordingly, Applicants request that the § 102 rejections be withdrawn.

Claims Rejection Under 35 U.S.C. § 103

Claims 2, 3, 8-14 and 24-38

Claims 2, 3, 8-14 and 24-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tao in view of U.S. Patent No. 6,198,608 to Hong et al. ("Hong"). To establish a *prima facie* case of obviousness, the prior art reference (or references when combined) must teach or suggest all the claim limitations. Further, the Examiner must articulate some reason or rationale to combine the references as suggested. Applicants submit that the rejected claims all contain limitations which are not described or taught by the cited references. Further, the Examiner has failed to provide any reasonable rationale supporting the combination of references.

As is the case with the Tao reference discussed above, the portions of the Hong reference

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cited by the Examiner do not teach any of the limitations found in Applicants' claims. Like Tao, Hong teaches a slow ion-milling layer that serves as a mask during the milling process. As discussed above, this is virtually the opposite of the process claimed by Applicants. The rejected claims teach an overlayer with a mill rate that closely approximates the mill rate of the substrate. Both Hong and Tao teach a process with a mask layer which mills at a much slower rate than the substrate. As discussed in great detail in Applicants' Specification, the process described by Tao and Hong would result in a large degree of curtaining, rather than the uniform planar face produced by Applicants' invention and required by the rejected claims.

Applicants also note that according to the Examiner, "by selection of layers in Tao et al., one determines what layers to select and each layer has its own etching characteristics." Even if this were an accurate statement of the teachings of Tao, the Examiner does not mention (and Tao does not teach) selecting a first material for a protective layer "from known materials having a mill rate at higher incidence angles that will produce the desired topography of the cross-section face." This limitation (found in Applicants' claims 24-38) is simply not taught or even suggested by any of the cited references.

The Examiner also states that Hong teaches that "the second material can comprise carbon." However, the section of Hong cited by the Examiner does not state that carbon can be used as a protective layer; rather the cited section teaches the use of conductive layers of TiC and TaC. Although these compounds taught by Hong may contain carbon atoms, they are not a "layer of carbon" as required, for example, by Applicants' claim 39 or amended claim 21. The only carbon layer taught by the reference is a layer of "diamond-like carbon" that is used under the sensor layer to help create a steeper slope at the edge of the sensor layer (to create a more defined width which can read bits on a track much more accurately). See Hong, col. 3, lines 37-49. In

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other words, Hong only teaches a carbon layer underneath the substrate being milled, rather than a carbon layer on top of the substrate as required by Applicants' claims.²

Further, the Examiner has not provided any reasonable rationale supporting the combination of references. According to the Examiner, "[t]he motivation for utilizing the features of Hong et al. is that it allows for utilizing a low milling rate material." Applicants respectfully submit that this is not a reasonable explanation. Tao already made use of a low milling rate mask layer. See Tao, col. 4, lines 37-67. There is nothing in the references to suggest that the materials taught by Hong would be as effective as the mask materials already taught by Tao. Further, the carbon layer in Hong is underneath the sensor layer (the layer being cross-sectioned). The Examiner has given no reasonable explanation for combining such a layer with Tao, or for putting the layer on top of the substrate being cross-sectioned.

Claims 15-23 and 39

Claims 15-23 and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tao et al., in view of Hong and further view of U.S. Patent No. 6,889,113 to Tasker et al ("Tasker"). As discussed above, neither the Tao nor Hong references teach or suggest all the claim limitations in Applicants' claims. As for the Tasker reference, Applicants submit that 35 U.S.C. § 103 (c) provides:

(1) Subject matter developed by another person, which qualifies as prior art only under one or more of subsections (e), (f), and (g) of section 102 of this title, shall not preclude patentability under this section where the subject matter and the claimed invention were, at the time the claimed invention was made, owned by the same person or subject to an obligation of assignment to the same person.

² Hong does teach an overcoat of diamond-like carbon (DLC) to protect the finished sensor from corrosion and from contact with the disk, tape or other media. Hong, col. 7, lines 19-24. However, this layer has nothing to do with the milling of the sensor.

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Applications and references (whether patents, patent applications, patent application publications, etc.) will be considered by the examiner to be owned by, or subject to an obligation of assignment to the same person, at the time the invention was made, if the applicant(s) or an attorney or agent of record makes a statement to the effect that the application and the reference were, at the time the invention was made, owned by, or subject to an obligation of assignment to, the same person.

The current application 10/716,181 and the Tasker patent were, at the time the invention was made, owned by FEI Company, the assignee of the present invention.

Accordingly, Applicants request that the § 103 rejections be withdrawn.

All Remaining Claims

Applicants submit that the remaining claims, being dependent from claims that are allowable for reasons stated above, are also allowable. Accordingly, Applicants requests that the objections to these remaining claims also be withdrawn.


Conclusion

It is believed that all of the pending issues have been addressed. However, the absence of a reply to a specific objection, issue, or comment does not signify agreement with or concession of the rejection, issue, or comment. In addition, because the arguments made above may not be exhaustive, there may be reasons for patentability of any or all pending claims (or other claims) that have not been expressed. Finally, nothing in this reply should be construed as an intent to concede any issue with regard to any claim, except as specifically stated in this reply, and the amendment of any claim does not necessarily signify concession of unpatentability of the claim prior to its amendment.

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Applicants submit that all claims in the application are now in condition for allowance, and
Applicants respectfully request that a timely Notice of Allowance be issued in this case.

Respectfully submitted,



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exemplary claim 1, which appears in the appendix to the appellant's Brief (Paper No. 15).

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The prior art references of record relied upon by the examiner in rejecting the appealed claims are:

Board of Patent Appeals and Interferences

Patent and Trademark Office (P.T.O.)

EX PARTE
PETER
RASMUSSEN

Appeal No. 1998-2240
Application No. 08/443,058

NO DATE REFERENCE AVAILABLE FOR THIS
DOCUMENT

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Before ABRAMS, FRANKFORT, and GONZALES
Administrative Patent Judges.
ABRAMS
Administrative Patent Judge.

ON BRIEF

DECISION ON APPEAL

This is a decision on appeal from the examiner's final rejection of claims 1, 5, 7, 8, and 10-18, which are all of the claims pending in this application.

We REVERSE.

BACKGROUND

The appellant's invention relates to a covering for a sphere or hemisphere. An understanding of the invention can be derived from a reading of

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Wigal

3,055,123

Sep. 25, 1962

Dukes

3,063,163

Nov. 13, 1962

Claims 1, 5, 7, 8, and 10-18 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite. [FN1]

Claims 1, 5, 7, 8, and 10-18 also stand rejected under 35 U.S.C. § 103 as being unpatentable over Wigal in view of Dukes.

Rather than reiterate the conflicting viewpoints advanced by the examiner and the appellant regarding the above-noted rejections, we make reference to the Answer (Paper No. 16) for the examiner's complete reasoning in support of the rejections, and to the Brief (Paper No. 15) for the appellant's arguments thereagainst.

OPINION

In reaching our decision in this appeal, we have given careful consideration to the appellant's specification and claims, the applied prior art references, the respective positions articulated by the appellant and the examiner, and the guidance provided by our reviewing court. As a consequence of our review, we make the determinations which follow.

The appellant's invention is directed to a covering for a sphere or hemisphere, with particular application to a globe such as those upon which geographic features are presented. The invention comprises a flexible sheet that is cut so as to provide a plurality of polyconic gores extending from a central hub. The sheet can lie flat or can be placed upon a sphere and will conform to the surface thereof. An important feature of the invention is that the flexible sheet is readily removable from the globe so that it can be exchanged for sheets having other representations thereon. The invention further comprises a removable hemispherical cover that is shaped to closely overlay the sheet when the sheet is positioned on a globe.

The Rejection Under 35 U.S.C. § 112, Second

Paragraph

*2 It is the examiner's position that independent claims 1 and 13 are indefinite because the phrase "shaped to closely overlay" does not "require that the cover is overlaid [sic] the sheet," and because the phrase "readily removable" is unclear. We do not agree.

The second paragraph of 35 U.S.C. § 112 requires claims to set out and circumscribe a particular area with a reasonable degree of precision and particularity. *In re Johnson*, 558 F.2d 1008, 1015, 194 USPQ 187, 193 (CCPA 1977). In making this determination, the definiteness of the language employed in the claims must be analyzed, not in a vacuum, but always in light of the teachings of the prior art and of the particular application disclosure as it would be interpreted by one possessing the ordinary level of skill in the pertinent art. *Id.* We do not understand the reasoning behind the examiner's problem with the phrase "shaped to closely overlay." This is only a part of the language describing the cover which, in full, reads "shaped to closely overlay said sheet when said sheet is positioned upon said sphere or hemisphere." From our perspective, the language of the claim, especially when considered in the light of the explanation of the invention provided in the specification, very clearly describes the globe and its relationship to the other components of the claimed invention.

With regard to the requirement that the flexible sheet be "readily" removable, we first note that the common definition of "readily" is "without much difficulty; easily." [FN2] Looking to the specification, we find that the cover is described as "holding" the sheet in place on the globe or, when a cover is not used, the sheet is held in place by electrostatic forces or through the use of "tacky, but readily removable, adhesives" (page 5). In our opinion, one of ordinary skill in the art clearly would have understood that "readily removable" means easy to remove, such as by using no attachment means at all (when a cover is used), or

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other means that are easily overcome by the user (when the cover is not used). Thus, we find this phrase to be in conformance with the second paragraph of Section 112.

This rejection is not sustained.

The Rejection Under 35 U.S.C. § 103

The test for obviousness is what the combined teachings of the prior art would have suggested to one of ordinary skill in the art. See, for example, In re Keller, 642 F.2d 413, 425, 208 USPQ 871, 881 (CCPA 1981). In establishing a *prima facie* case of obviousness, it is incumbent upon the examiner to provide a reason why one of ordinary skill in the art would have been led to modify a prior art reference or to combine reference teachings to arrive at the claimed invention. See Ex parte Clapp, 227 USPQ 972, 973 (Bd. Pat. App. & Int. 1985). To this end, the requisite motivation must stem from some teaching, suggestion, or inference in the prior art as a whole or from the knowledge generally available to one of ordinary skill in the art and not from the appellant's disclosure. See, for example, Uniroyal, Inc. v. Rudkin-Wiley Corp., 837 F.2d 1044, 1051, 5 USPQ2d 1434, 1438 (Fed. Cir.), *cert. denied*, 488 U.S. 825 (1988).

*3 Independent claim 1 stands rejected as being unpatentable over Wigal in view of Duke. This claim requires, *inter alia*, that the flexible sheet be "readily removable" from the sphere or hemisphere which it overlies. As we explained in preceding paragraphs, we consider this to mean that it be easily removable, that is, not permanently attached or attached in a manner that would require the use of tools, solvents, or the like to remove it. The examiner's position with regard to this limitation (Answer, page 5) is that because Wigal does not state whether the adhesive used to attach the sheet to the globe is permanent or removable, using a removable adhesive is included in the teachings that one of ordinary skill in the art would derive from it. The examiner further opines that "[i]t should be noted that all adhesive become[s] removable with time as it looses [*sic*, loses] its adhesivity," a statement that not only begs the question of whether a sheet attached therewith would be "readily removable" but, in the absence of supporting evidence, is untenable on its face.

We agree with the appellant that Wigal does not support the examiner's position. Wigal has among the objects of his invention providing a device that is "durable and stable, being resistant to breakdown through the normal, expected hard usage on the part of young users" (column 1, lines 30-33). In furtherance of this aim, Wigal utilizes hard setting adhesives such as epoxy resin to attach together the sections of the globe (column 3, lines 10-14), and teaches that the covering sheet is provided with "a pressure sensitive adhesive coating" (column 3, line 28) and is "secured"^[FN3] to the globe (column 4, lines 21, 22-32 and 49). Nowhere does Wigal explicitly teach that the sheet can be removed from the globe, nor in our opinion is this implicit in the disclosure. In this regard, Wigal does not recognize the problem to which the appellant has directed his inventive energies, namely, providing a system wherein the covering sheet can easily be removed and exchanged for another. In sum, there would seem to be no reason for Wigal's covering sheet to be removable.

Neither the examiner's presentation of the rejection nor our own analysis of the reference lead us to the conclusion that one of ordinary skill in the art would have been taught by Wigal that the covering sheet disclosed therein is "readily removable" from the underlying globe. In addition, we fail to perceive any teaching, suggestion or incentive which would have led the artisan to utilize adhesive having such properties as to allow the sheet to be "readily removable" from the globe in the Wigal device, other than that which is obtained through the hindsight afforded one who first viewed the appellant's disclosure.^[FN4] Consideration of the teachings of Duke fails to alleviate this shortcoming.

For the reasons expressed above, it is our conclusion that the teachings of the applied references fail to establish a *prima facie* case of obviousness with regard to the subject matter of independent claims 1 and 13, and we therefore will not sustain the rejection of these claims or claims 5, 7, 8, 10-12 and 14-18, which depend therefrom.

CONCLUSION

*4 Neither rejection is sustained.

The decision of the examiner is reversed.

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No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a).

REVERSED

BOARD OF PATENT APPEALS AND
INTERFERENCES

NEAL E. ABRAMS

Administrative Patent Judge

CHARLES E. FRANKFORT

Administrative Patent Judge

JOHN F. GONZALES

Administrative Patent Judge

FN1. Claims 10-18 were omitted from the statement of this rejection in the Answer. However, since claim 13 was mentioned in the explanation of the rejection, this omission appears to have been inadvertent.

FN2. See, for example, Merriam Webster's Collegiate Dictionary, Tenth Edition, 1996, page 972.

FN3. The common definition of "to secure" is "to make fast." Merriam Webster's Collegiate Dictionary, Tenth Edition, 1996, page 972.

FN4. The mere fact that the prior art structure could be modified does not make such a modification obvious unless the prior art suggests the desirability of doing so. See In re Gordon, 733 F.2d 900, 902, 221 USPQ 1125, 1127 (Fed. Cir. 1984).

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